1.OUT LINE

HANDY-700 ,a compact type printer with various functions which may be used as a hand-held/belt-hung, Battery-operated unit, Infrared interface or as desk-top/wall-hung unit to meet a today printing needs.

1-1.FEATURES

***. Ultra small-sized portable and desk-top configuration**.

***. Quiet and fast printing(50mm/sec) using the direct line thermal printing method**.

*** One(1) hour continuous printing with fully charged Lit-ion battery**

***. Extremely easy to load a paper by CLAMSHELL unit.**

***. Easy maintenance and head cleaning.**

***. Setting the baud rate, handshaking, International Characters, density ETC. by external button.**

***. Support for many bar code types(JAN/EAN-8,JAN/EAN-13, CODE39,CODE128,CODE93).**

***. Command selection of font sizes(12x24,8x16).**

***. Current printer status.**

***. Auto online mode**

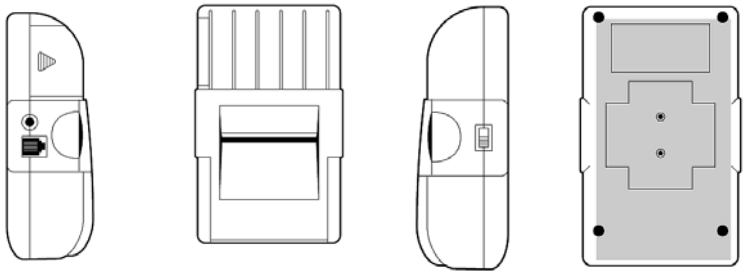
***. Self-test facility**

***. Dump mode function**.

1-2. Printer Parts & Accessories.

1-2-1 Printer parts :

1) Printer cover
2) Operation panel
3) Power connector
4) Interface connector
5) Infrared window
6) Battery door
7) Power switch
8) Belt rack



1-2-2 Accessories.

The set, besides the printer main unit, contains the following accessories :

Roll paper	(x 1)
Interface cable	(x 1)
Rack mounting bracket	(x 1)
Screw for bracket	(x 2)
Instruction Manual	(x 1)
Belt rack	(x1)
Lit-ion battery	(x1)
Adapter for recharging	(x1)

1-2-3 Model classfication

Handy700 – R S B

- Handy700 : Model Name
- Interface : R(Serial RS-232C)
  I(IrDA-Sir)
- Character Set : S(Standard)
  J(External font)
- Power supply : D(No battery)

B(Battery with external charging)
C(Battery with internal charging)

2.General Guide.

2-1.Description of printer parts

The HANDY700 printer is based around a patented easy-loading printer mechanism designed. This mechanism consists of a main cavity into which a paper roll is dropped for loading. The thermal print head is at the front of this cavity and a rubber roller is attached to the lid of the mechanism. When the lid is closed, The paper is trapped between the rubber roller and the print-head to give a close alignment and a consistent pressure.

2-1-1.Indicator lights

The HANDY700 printer has two LEDs on the front panel.
The control panel lights provide information on printer conditions.

POWER LED(Green) : The POWER light is ON when power is turned ON.
The POWER light flashes when head temperature is high(60C).

BATTERY(Red) : The BAT light is ON when battery is under charge the battery.
When the battery is full charged, light is blinks every second.
The BAT light is OFF when printer have no line adapter.

ERROR(Green): The POWER light flashes every second when the paper roll is nothing or
The paper cover is opened.

NOTE : Printer go into online mode automatically and print the remaining
Data 5 seconds after closing paper cover.

2-1-2. Buttons.

FEED Button : Press the FEED button to advance paper. You can also press the FEED button
Continuously to feed paper continuously.
FEED button is not operated when ON line button is off.

SEL Button : SEL Button perform set-up program(See Chapter self-test and set-up mode).

2-1-3.Connectors

The Power connector is fitted on the right side of printer.
This Power connector is for Battery charging and direct DC power supply.
In case of battery with internal charging type, Printer does not work when printer is connected with adapter directly, without battery.

The Interface connector is fitted at right side of printer. This is 6pins RJ connector for RS-232C Communication.

2-1-4.Belt rack holes

There are two holes in the base of the printer which allow the printer to be attached to vertical Surface Such as a wall or waistband.

2-1-5.Sensors

The HANDY700 Printer is fitted with three sensors.
The **DOOR –CLOSED SENSOR** is to avoid the damaging the print-head, When the door is open.
The **END-OF-PAPER SENSOR(EOP)** detects the presence of paper near to the print-head.
To avoid damage the print-head, When no paper is detected.
The **Infrared IrDA SENSOR** is fitted on the front panel. This sensor is used to interface with Infrared communication.

2-2.Paper specification.

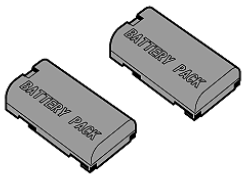
Paper width : 57mm
Maximum paper roll diameter : 40mm
Maximum paper thickness : 60gsm
Emulsion(sensitive) side : On out side of roll.
Recommended paper : Mitsubishi,P220AG

2-3.Power supply.

2-3-1. Adapter :

The Internal battery charging adapter is a DC12V and current capacity of 1A or more.
External Direct power supply is DC12V and current capacity 2.5A or more.
It packs a DC JACK type connector in which the inner contact is with
External diameter(3.5mm),Internal diameter(1.3mm),length(10mm).

2-3-2 Battery



1) Kind of Specified Products
   Name : Camcorder battery pack
   Pack type : IN-5XL
   Cell type : LITHIUM-ION
2) Basic Characteristics
   Normal Voltage : 7.2V
   Minimum Capacity : 1650mAh
   Charge Conditions : Charge Voltage : 8.40±0.05V
   Maximum Charge Current : 1650mAh
   Charge Method : CCCV(Constant Current/Constant Voltage)
   Discharge Condition : Maximum Discharge Current : 2475mAh(1.5C)
   Discharge End Voltage : 5.5V/pack
   Temperature : Charge : 0 ~ +45°C
   Discharge : -10 ~ +40°C
   Storage : -20 ~ +50°C within a month(50% charged condition)
   Long term Storage : -20 ~ +35°C within 3 months(50% charged condition)
   Relative Humidity : 65 ±20%
   Weight : About 100g

2-3-3 Charging battery

1) Turn OFF the power switch, Connect the adapter to the printer and make the adapter Electrified
2) then begin to charge. Full charging may need 3 hours under condition of no electric energy in battery.
   Battery light flash every second when it is charged fully.

3) Printer does not operate normally when the battery energy is about exhausts.
   At that time battery light is ON .

NOTE : Normally, Printer does not work when printer is connected with adapter directly
Without battery.

4) When printer only uses full charged battery without external power connection, It will
Work one(1) hour printing continuously.

2-4.Specifications.

Printing method	**Direct thermal**
No. of columns	**32 columns : 384 dots/lines**
Character size	**1.5mm x 3.0mm (12x 24)**
Line pitch	**4.0mm**
Paper	**57.5 x 60mm**
Interface	**Serial(RS-232C) and IrDA**
International character	**U.S.A., FRANCE, U.K., DENMARK I, SWEDEN,ITALY, SPAIN, JAPAN, NORWAY, DENMARK II, KOREA**
Buffer	**7Kbyte(option:128KByte)**
Bar code	**UPC-A,EAN13,EAN8, ITF, CODABAR, CODE39,CODE93, CODE128**
Mechanical lifetime	**50Km**
Baud rate	**2400 – 115200 bps**
Power requirement	**12V, 1.2A (With Battery)** **12V, 3A (Without battery)**
Battery	**Lit-ion 7.2V**
Operating temperature	**0 – 40 °C**
Humidity	**20 - 80 %**
Dimensions(mm)	**92 x 140 x 51**

3.Operation.

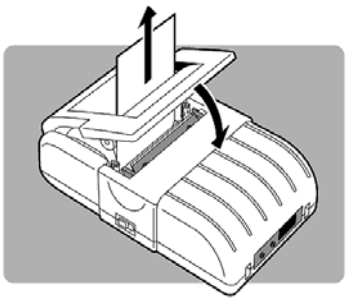
3-1.Precautions for installation.

HANDY-700 Printer may be installed in a variety of applications but, to Maintain your unit in optimum working conditions, the following recommendations should Be followed.

- Avoid dirty or dusty location or those with excessive heat or humidity.
- Choose a stable level or solid wall on which to mount the printer.
- Ensure that the adapter provides the correct operating voltage.
- Care must be taken to ensure that any power adapter supplied by the customer meets With national safety requirements and has the correct output voltage and polarity.

3-2.Opening/Closing of printer cover

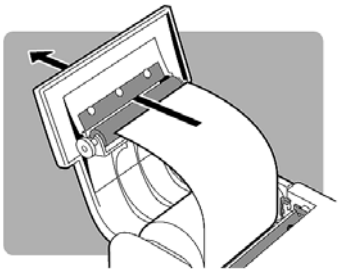
Applying your finger on both side of printer, push it up when the lock is released as Shown in the drawing. It open by about 120° centering around the fixed axis. For the closing. Pressing the Top cover, Tightly close it until click sound is heard. Also, confirm, on closing, that paper is free of slackening.



3-3.Installing paper.

Please ensure that the correct grade of paper is used with the HANDY-700. It is extremely easy to load a new paper roll into the printer by following thease simple steps :

- Open the cover and remove the old paper core.
- Drop the new roll into the reservoir so that it will rotate in the correct direction (i.e. so that the emulsion side of the paper outside rests against the print-head)
- Insert the edge of the roll paper into the hole of cover and closing cover.



NOTE : If there are unprinted data in the memory after changing paper, The printer Go into online mode automatically and print the remaining data 5 seconds After closing paper cover.

3-4.Self-test.

The purpose of the self test The self test checks whether the printer has any problems.
When the printer does not function properly, Please contact the supplier.

* The self test checks the following
+.Control circuit functions +.Software version
+. Setting parameters +. Printer quality

* Running the self test
+.Make sure the cover is closed and roll paper is installed correctly.
+.Turn on the power while pressing the FEED button. The self test begins.
+.The following contents are printed for printer current status printing.

- Version : 1.1.6
- Data bit : 8 bit
- Parity : None
- Baud rate : 9600 bps
- Handshaking : DTR
- Country : USA
- Print mode : Text(upright)
- Paper : Normal paper
- Density : 100%
- IrDA : IrDA-SIR
- Buffer size : 7000Byte
- Head volt : 7.1V
- Head temp : 23C

*

+ The self test automatically ends after printing on the paper.
+ The printer becomes ready to receive data from the host.

3-5.Set-up mode.

Following thease step when setting the program.
Turn ON the power while pressing SEL button then printer will go into set-up Mode And print the current parameter status.
The power LED indicator will flash every second to indicator SET-UP mode.

Each time the FEED button is pressed and released the next printer parameter is Printed. Pressing the SEL button will cause the status of that parameter to change In the sequence shown.
Once the correct status has been selected then press SEL button while pressing FEED button.

NOTE : If no buttons are pressed for 15 seconds ,The set-up mode is automatically Terminated without changing the original parameters.

SET-UP S/W	FEED S/W
Baud rate	2400,4800,9600,19200,38400,57600,115200
Handshaking	DTR, X-on/X-off
Country	USA,Korea,Cyrillic,Denmark2,Norway,Japanese,Spain,Italy,Sweden,Denmark1,UK, Germany,France
Print mode	Text(upright), Data(inverted)
Paper	Normal paper, Reprint paper
Density	50%,55%,60%,65%,70%,75%,80%,85%,90%,95%,100%,105%,110%,115%,120%, 125%,130%,135%,140%,145%,150%
IrDA	Chamjin –Ir, IrDA-Sir, BHT-Ir(DENSO),EL-ME-Ir

3-6.Dump mode.

*The purpose of Dump mode
Dump mode check whether printer receive data correctly from host or not.

*Running the dump mode
Turn ON the power while pressing SEL and FEED button together ,Then printer Print [DUMP TEST] and wait data from host.

3-7.Maintenance.

The HANDY-700 printer is requires very little maintenance but may benefit From cleaning as detailed below.

- Cleaning the printer
  The external surfaces may be kept clean by wiping a lightly damp cloth but this Only be done after unplugging all electronic connections. Great care should Be taken to ensure that the inside surfaces are kept dry at all times and that the External surfaces are thoroughly dry before re-making any electrical connections

- Cleaning the print-head

  Depending of the environment in which the printer is used, The print-head may
  The print-head may accumulate dust. Therefore it is necessary to clean it periodically.
  In order to maintain a good print quality. The cleaning period is dependent on the
  Environment and usage of the printer but the print-head should be cleaned at least
  Once a year or up to once a month in heavy duty applications.
  The print-head should always be cleaned immediately if the print becomes visibly
  Fainter due to contamination of the print-head. To clean the print-head :
  +.Switch off the printer.
  Never clean the head immediately after printing, The print-head may be hot.
  +. Open the printer cover and remove the paper roll.
  +. Clean the heating dots of head with a cotton stick containing a alcohol solvent
  (ethanol, methanol or IPA) but do not touch the print-head with your fingers.
  +. Allow the solvent to dry.
  +. Reload the paper and close the cover.

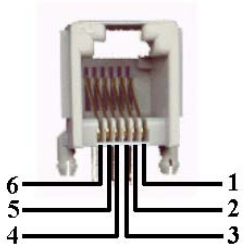
3-8.Connectors & Cables.

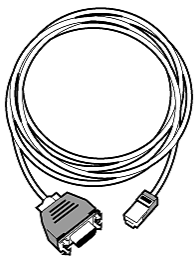
3-8-1. Interface connectors

1).RS-232C

Printer		
Signal	I/O	Pin
Vin(+12V)	-	1
DTR	O	2
RX	I	3
GND	-	4
TX	O	5
GND	-	6

Host		
Pin	I/O	Signal
1	I	DCD
2	I	RX
3	O	TX
4	O	DTR
5	-	GND
6	I	DSR
7	O	RTS
8	I	CTS
9	I	RI





IrDA Protocol

1. Transmission control character

SYMBOL	VALUE	SYMBOL	VALUE
SOH	01h	PR_RES(WAIT)	3Bh
STX	02h	PR_START	31h
ETX	03h	PR_END	32h
PR_RES(ACK)	06h	PR_DATA	33h
PR_RES(NAK)	15h	PR_STAT	34h

2. FCS Calculation

2.1 Polynomial(CCITT X.25)

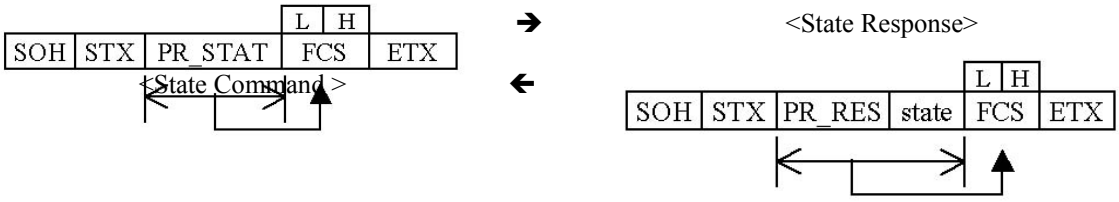
$$X^{16} + X^{12} + X^5 + 1$$

2.2 Examination("C" Language)

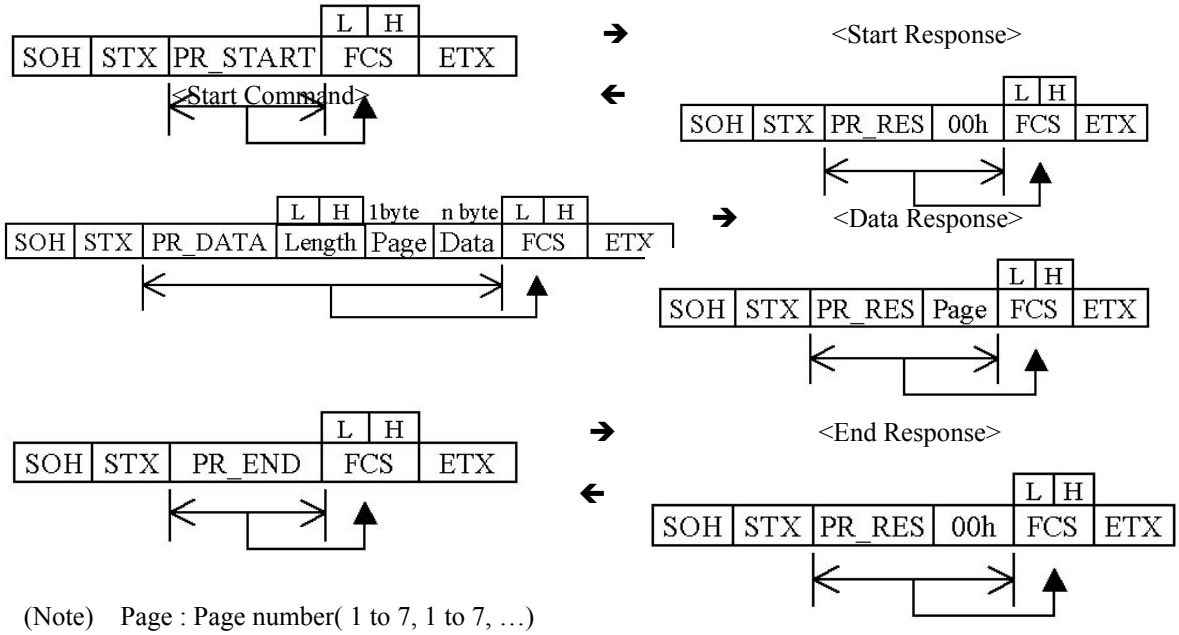
```
union u_crc{
   unsigned char low;
   unsigned char buf[2];
   unsigned int    value;
}crc;
unsigned int crctable[260];


void Crc(unsigned char value){ crc.value=crc.buf[1] ^ crctable[crc.low^value] ;}
void CrcTableMake(void){
   unsigned int i,j,k;
   for(i=0;i<256;i++){
      k=i;
      for(j=0;j<8;j++){
         if(k&1) k=(k>>1)^0x8408U;
         else k>>=1;
      }
      crctable[i]=k;
}
void main(void){
   crc.value=0xFFFFU;         //Init
   Crc(0x30);
   Crc(0x31);
   printf("Result:0x%04X\n",crc.value^0xFFFFU);
}
```

3. Transmmission Format

3.1 Status check



3.2 Data format



(Note) Page : Page number(1 to 7, 1 to 7, …)
Length : data size(0 to 2Kbyte)

4. Example(Normal transmission)

4.1 Normal phase 1

Host	Direction	Printer
Start Command	→	
	←	Start Response(Ack)
Data1 Command	→	
	←	Data1 Response(Ack)
	.	
	.	
	.	
DataN Command	→	
	←	DataN Response(Ack)
End Command	→	
	←	End Response(Ack)

4.2 Normal phase 2

Host	Direction	Printer
Start Command	←	
	→	Start Response(Ack)
Data1 Command	←	
	→	Data1 Response(Ack)
State Command	←	
	→	State Response(Ack)

Data2 Command	← →	Data2 Response(Ack)
End Command	← →	End Response(Ack)

4.3 Normal phase 3

Host	Direction	Printer
Start Command	→ ←	Start Response(Ack)
Data1 Command	→ ←	Data1 Response(Ack)
Data2 Command	→ ← ←	Wait Response Wait 0.5sec(max) Data2 Response(Ack)
End Command	→ ←	End Response(Ack)

5. Abnormal transmission

5.1 Phase with no receive command over 3 times

Host	Durection	Printer
Command (Wait 0.5sec)	→	(No action due to receipt of no command)
Command (Wait 0.5sec)	→	
Command (Wait 0.5sec)	→	
The status is that obstacles or power of the printer is off. The host indicate "no communication proceed"		

5.2 Phase with no start command

Host	Direction	Printer
Start Command (Wait 0.5sec)	→	(No action due to receipt of no Command)
Start Command	→ ←	Start Response(Nak)
Start Command	→ ←	Start Response(Ack)
Data Command	→ ←	Data Response(Ack)
End Command	→ ←	End Response(Ack)

5.3 Phase 1 with no data command

Host	Direction	Printer
Start Command	→ ←	Start Response(Ack)

Data1 Command (Wait 0.5sec)	➔ ➔	(No action due to receipt of no command)
Data1 Command	➔ ➔	Data1 Response(Ack)
Data2 Command	➔ ➔	Data2 Response(Nak)
Data2 Command	➔ ➔	Data2 Response(Ack)
Data3 Command (Due to no response,Waiting for 0.5sec)	➔ ➔	Data3 Response(Ack)
Data3 Command	➔ ➔	Data3 Response(Ack) (The printer,that received data3 two times,Only send ACK response and do not print second data3)
End Command	➔ ➔	End Response(Ack)

5.4 Phase 2 with Data Command

HOST	Direction	Printer
Start Command	➔ ➔	Start Response(Ack)
Data1 Command	➔ ➔	Data1 Response(Nak) or no response
Data1 Command	➔ ➔	Data1 Response(Nak) or no response
Data1 Command	➔ ➔	Data1 Response(Nak) or no response
End Command (Ignore the Response)	➔	
Due to obstacle or printer's problem,The host indicate no communication Proceed		

5.5 Phase 3 with no Data Command

Host	Direction	Printer
Start Command	➔ ➔	Start Response(Ack)
Data1 Command (No receipt of data1 response within 0.5sec after receiving wait response	➔ ➔ ➔	Wait Response Data1 Response(Ack)
Data1 Command	➔ ➔	Data1 Response(Ack) (The printer,that receiced data1 two times,Only send ACK response and do not print second data1
Data2 Command	➔ ➔	Data2 Response(Ack)
End Command	➔ ➔	End Response(Ack)

5.6 Phase with no End Command

Host	Direction	Printer
Start Command	➔ ➔	Start Response(Ack)
Data Command	➔	

	←	Data Response(Ack)
End Command	→	(No action due to receipt of no Command)
End Command	→	
End Command (Because there was nornal printing action,This case does not involve in error)	→	

6. Example

6.1 Status check

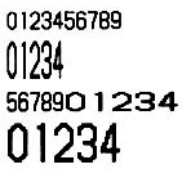
Host	Direction	Printer
01h,02h,34h,DFh,87h,03h	→ ←	(stat:00h) 01h,02h,06h,00h,97h,5Bh,03h

(Note : Refer ESC v command for status valus)

6.2 Printing data

Host	Direction	Printer
01h,02h,31h,72h,D0h,03h	→ ←	01h,02h,06h,00h,97h,5Bh,03h
01h,02h,33,02h,00h,01h,1bh,40h,4Bh,43h,03h	→ ←	01h,02h,06h,01h,1Eh,4Ah,03h
01h,02h,33,05h,00h,02h,30h,31h,32h,33h,34h,99h,ACh,03h	→ ←	01h,02h,06h,02h,85h,78h,03h
01h,02h,33,05h,00h,03h,35h,36h,37h,38h,39h,37h,DFh,03h	→ ←	01h,02h,06h,03h,0Ch,69h,03h
01h,02h,33,01h,00h,04h,0Ah,EBh,D2h,03h	→ ←	01h,02h,06h,04h,B3h,1Dh,03h
01h,02h,33,08h,00h,05h,1bh,21h,10h,30h,31h,32h,33h,34h,0Ah,22h,93h,03h	→ ←	01h,02h,06h,05h,3Ah,0Ch,03h
01h,02h,33,08h,00h,06h,1bh,40h,35h,36h,37h,38h,39h,10h,51h,03h	→ ←	01h,02h,06h,06h,A1h,3Eh,03h
01h,02h,33,09h,00h,07h,1bh,21h,20h,30h,31h,32h,33h,34h,0Ah,26h,1Dh,03h	→ ←	01h,02h,06h,07h,28h,2Fh,03h
01h,02h,33,09h,00h,01h,1bh,21h,30h,30h,31h,32h,33h,34h,0Ah,3Dh,40h,03h	→ ←	01h,02h,06h,01h,1Eh,4Ah,03h
01h,02h,32h,E9h,E2h,03h	→ ←	01h,02h,06h,00h,97h,5Bh,03h

<Result>



Command Summary

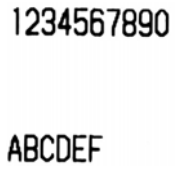
Command	Name	Page
HT	Horizontal tab	
LF	Print and line feed	
FF	(1)Print and return (2)Print and feed label to print starting position	
CAN	Cancel print data	
ESC FF	Print data in label mode	
ESC ! n	Select print modes	
ESC $ nL nH	Set absolute print position	
ESC * m nL nH[d1…dk]	Select bit-image mode	
ESC – n	Turn underline mode on/off	
ESC 2	Set 1mm line spacing	
ESC 3 n	Set line spacing	
ESC @	Initialize printer	
ESC J n	Print and feed paper	
ESC R n	Select international character set	
ESC d n	Print and feed paper n lines	
ESC E	Emphasized character	
ESC SP	Setting of character space	
ESC V n	Turn 90 clockwise rotation mode on/off	
ESC v	Transmit printer status	
ESC { n	Set/cancel upside-down character printing	
FS &	Setting Kanji mode	
FS !	Specify Kanji print mode	
FS -	Kanji underline	
FS .	Cancel Kanji mode	
FS S	Setting Kanji character space	
FS W	4 fold character of Kanji	
FS 2	External character	
GS ! n	Select character size	
GS B n	Turn white/black reverse printing mode	
GS H n	Select printing position of HRI characters	
GS L nL nH	Set left margin	
GS h n	Select height of bar code	
GS k m[d1…dk] NUL	Print bar code	
GS k m n[d1…dn]	Print bar code	
GS w n	Select bar code width	
GS x n	Set bar code print starting position	
DC2 ! n	Select print paper	
DC2 # n	Select print density	
DC2 E	Set the printing finished	
DC2 T	Test Printing	
DC2 m s nL nH	The length of mark position	
DC2 * r n [d1…dn]	Set bit image	
DC2 V nL nH	Set MSB bit image	
DC2 v nL nH	Set LSB bit image	
FS C n	Select code system	

HT(Horizontal tab)

[Format] ASCII : HT
Hex : 09
Decimal : 9

[Description] Moves the print position to the horizontal tab position.
This command is ignored If the next horizontal tab go over possible printing area.
Horizontal tab position(units:dot)
- Font A(8x16): 64,128,192,256,320
- Font B(12x24): 96,192,288

[EX] Data : “123456789012345678901 2”,0Ah,”123”,09h,”456”,09h,
”789”,09h,”012”,09h,”345”,0Ah
Print :

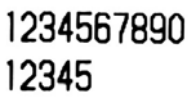


LF(Print and line feed)

[Format] ASCII : LF
Hex : 0A
Decimal : 10

[Description] Print the data in print buffer and performs next line feed.

[EX] Data : “1234567890”,0Ah,”12345”,0Ah
Print :



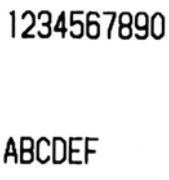
FF(Print and return, Print and feed label to print starting position)

[Format] ASCII : FF
Hex : 0C
Decimal : 12

[Description] (1) Standard mode : Print data in the buffer and feed the paper to cutting line.
(2) Label mode : Print data in the print buffer and moves to starting position of next page.

[Reference] DC2 m s nL nH , DC2 E

[EX] Data : ”1234567890”,0Ch,”ABCDEF”,0Ah
Print :



CAN(Cancel print data)

[Format] ASCII : CAN
Hex : 18
Decimal : 24

[Description] Cancel print data in current line.

[EX] Data : “12345”,18h,”ABCDE”,0Ah
Print :

ESC FF(Print data in label mode)

[Format] ASCII : ESC FF
Hex : 1B 0C
Decimal : 27 12
[Description] In the Label mode,Print the data in the print buffer and moves to starting position of next pages.
[Reference] FF, DC2 E,DC2 m s nL nH

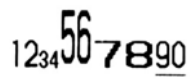
ESC ! n(Select print modes)

[Format] ASCII : ESC ! n
Hex : 1B 21 n
Decimal : 27 32 n

[Description]

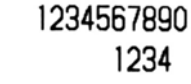
Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character font A(12x24) selected.
	On	01	1	Character font B(8x16) selected.
1				
2				
3				
4	Off	00	0	Double-height mode not selected
	On	10	16	Double-height mode selected
5	Off	00	0	Double-width mode not selected
	On	20	32	Double-width mode selected
6				
7	Off	00	0	Underline mode not selected
	On	80	128	Underline mode selected

[EX] Data : “12”,1Bh,21h,01h,”34”,1Bh,21h,10h,”56”,1Bh,21h,20h,”78”,
1Bh,21h,80h,”90”,0Ah
Print :



ESC $ nL nH(Set absolute print position)

[Format] ASCII : ESC $ nL nH
Hex : 1b 24 nL nH
Decimal : 27 36 nL nH
[Description] Set the print position of beginning(Left).
[nL + nH x 256] x 0.125 mm
0<= n <300
Default : 0
[Reference] GS L nL nH
[EX] Data : “1234567890”,0Ah,1Bh,”$”,3Ch,00,”1234”,0Ah
Print :

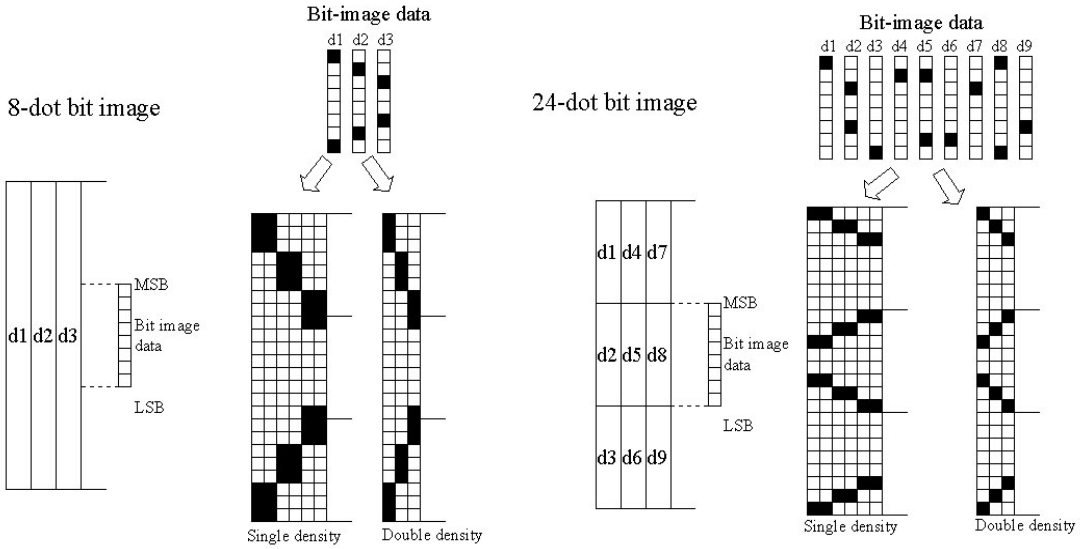


ESC * m nL nH[d1…dk](Select bit-image mode)

[Format] ASCII : ESC * m nL nH [d1…dk]
Hex : 1B 2A m nL nH [d1…dk]
Decimal : 27 42 m nL nH [d1…dk]

[Description] Select bit-image mode using n for the number of dots specified by nL and nH,as follows;
Print bit-image mode continouse : (1) Set the line specing to 24
(2) Select bit-image mode
(3) LF(Line feed)
(4) Repeat (2) and (3).

M	Mode	Verticak Direction	Horizontal Direction
		No. of Dots	Number of Data(k)
0	8-dot single-density	8	nL + nH x 256
1	8-dot double-density	8	nL + nH x 256
32	24-dot single-density	24	(nL + nH x 256) x 3
33	24-dot double-density	24	(nL + nH x 256) x 3



ESC – n(Turn underline mode on/off)

[Format] ASCII : ESC - n
Hex : 1B 2D n
Decimal : 27 45 n

[Description] Turns underline mode on or off,based on the following values of n.

N	Function
0,48	Turns off underline mode
1,49	Turns on underline mode(1-dot thick)
2,50	Turns on underline mode(2-dot thick)

[Reference] ESC ! n
[EX] Data : “123”,1Bh,”-“,01,”456”,1Bh,”-“,00,”789”,0Ah
Print :

123456789

ESC 2(Set default line spacing)

[Format] ASCII : ESC 2
Hex : 1B 32
Decimal : 27 50
[Description] Set the line spacing to 32(default) for each lines.
[Reference] ESC 3 n

ESC 3 n(Set line spacing)

[Format] ASCII : ESC 3 n
Hex : 1B 33 n
Decimal : 27 51 n
[Description] Set the line spacing.
Spacing : n x 0.125mm(1 dot size)
Range : 24<= n <= 255,
Default : 32
[Reference] ESC 2
[EX] Data : "12345",0Ah,1Bh,"3",40h,"12345",0Ah, 1Bh,"@","67890",0Ah
Print :

12345
12345

67890

ESC @(Initialize printer)

[Format] ASCII : ESC @
Hex : 1B 40
Decimal : 27 64
[Description] Clear the data in the print buffer and resets the printer mode (to the same state as when the power is turned on)
[EX] Data : 1Bh,"-",01,"12345",0Ah,"12345",1Bh,"@","ABCD",0Ah
Print :

12345
ABCD

ESC J n(Print and feed paper)

[Format] ASCII : ESC J n
Hex : 1B 4a n
Decimal : 27 74 n
[Description] Print the data in the print buffer and feeds nx0.125mm.
[Reference] ESC d n
[EX] Data : "12345",1Bh,4Ah,40h,"ABCD",0Ah
Print :

12345

ABCD

ESC R n(Select international character set)

[Format] ASCII : ESC R n
Hex : 1B 52 n
Decimal : 27 82 n

[Description] n selects an international character set from the following table.

[EX]

N	Character Set	N	Character Set
0	U.S.A.	6	Italy
1	France	7	Spain
2	Germany	8	Japan
3	U.K.	9	Norway
4	Denmark I	10	Denmark II
5	Sweden	11	Korea

Default : n = 0 (In case of no external ROM))
Default : n = 8 (In case of external Japanese ROM)
Default : n = 11(In case of external Korean ROM)
Default : n = 0(In case of external other cuntry ROM)

ESC d n(Print and feed paper n lines)

[Format] ASCII : ESC d n
Hex : 1B 64 n
Decimal : 27 100 n

[Description] Print the data in the print buffer and feed the paper n lines..

[Reference] ESC J n

[EX] Data : ”12345”,0Ah,1Bh,64h,02h,”ABCD”,0Ah
Print :

12345

ABCD

ESC v(Transmit printer status)

[Format] ASCII : ESC v
Hex : b 76
Decimal : 27 118

[Description] Transmit current status to host(Paper,voltage,temperature).

[Return] 1Byte status return

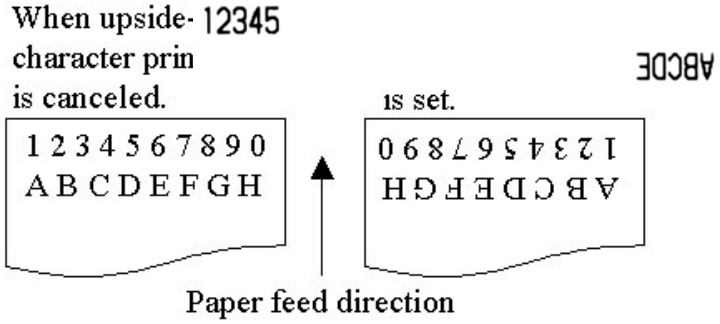
Bit	1	0
0(Paper)	Paper not present	Paper present
1(Temp)	Head high temperature	Head normal temperature
2(Label paper)	Label paper not present	Label paper present
3(Label hole)	Label hole not present	Label hole present
4(Cover)	Open	Close
5(Battery volt)	Battery low	Battery high
6(On-line)	Off-line	On-line
7(paper mode)	Label print	Normal print

ESC { n(Set/cancel upside-down character printing)

[Format] ASCII : ESC { n
Hex : 1B 7B n
Decimal : 27 123 n

[Description] Sets or cancel the Upside-down characters.
(Valid only when input at the beginning of a line.)
bit of n = 1(Sets), bit of n = 0(Cancel).
Default = 0

[EX] Data : ”12345”,0Ah,1Bh,7Bh,01h,”ABCDE”,0Ah



Print :

GS ! n(Select character size)

[Format] ASCII : GS ! n
Hex : 1D 21 n
Decimal : 29 33 n

[Description] Selects the character width/height.

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Double-height mode not selected
	On	01	1	Double-height mode selected
4	Off	00	0	Double-width mode not selected
	On	10	16	Double-width mode selected

[Reference] ESC ! n

[EX] Data : “12”,1Dh,21h,01,”34”,1Dh,21h,10h,”56”,1Dh,21h,11h,”78”,0Ah
Print:

GS B n(Turn white/black reverse printing mode)

[Format] ASCII : GS B n
Hex : 1D 42 n
Decimal : 29 66 n

[EX] Turns on or off white/black reverse printing mode.
If, n=0 , white/black reverse printing mode is turned off(Default).
If, n=1 , white/black reverse printing mode is turned on.

[EX] Data : “12345”,1Dh,42h,01h,”ABCD”,1Dh,42h,00h,”67890”,0Ah
Print :

GS H n(Select printing position of HRI characters)

[Format] ASCII : GS H n
Hex : 1D 48 n
Decimal : 29 72 n

[Description] Selects printing position of HRI characters when printing a bar code.

n	Printing position
0,48	No printed(default)
1,49	Above the bar code
2,50	Below the bar code
3,51	Both above and below the Bar code

[Reference] GS w n, GS h n, GS k m[d1…dk] NUL, GS k m n[d1…dn]

GS L nL nH(Set left margin)

[Format] ASCII : GS L nL nH
Hex : 1D 4C nL nH
Decimal : 29 76 nL nH

[Description] Sets the left margin.
Sets the left margin using nL and nH : [nL + nH x 256] x 0.125 mm
Range : 0 ≤ n < 300 (default = 0)

[Reference] ESC $ nL nH

[EX] Data : "1234567890",0Ah,1Dh,4Ch,50h,00h,"ABCD",0Ah,"1234",0A
Print :

1234567890
ABCD
1234

GS h n(Select height of bar code)

[Format] ASCII : GS h n
Hex : 1D 68 n
Decimal : 29 104 n

[Description] Selects the height of bar code.
Height of bar code : n x 0.125 mm
Range : 0 ≤ n < 255 (default :100)

[Reference] GS w n, GS H n, GS k m[d1…dk] NUL, GS k m n[d1…dn]

GS k m[d1…dk] NUL(Print bar code)

[Format] ASCII : GS k m [d1…dn] NUL
Hex : 1D 6B m [d1…dn] 00
Decimal : 29 107 m [d1…dn] 0

[Description] Selects a bar code system and prints the bar code.
M selects a bar code system as follows;

M	Bar Code System	Number of characters	Remarks
0	UPC-A	11 ≤k ≤12	48 ≤d ≤57
1	UPC-E	11 ≤k ≤12	48 ≤d ≤57
2	EAN13(JAN)	12 ≤k ≤13	48 ≤d ≤57
3	EAN8(JAN)	7 ≤k ≤8	48 ≤d ≤57
4	CODE39	1 ≤k	48 ≤d ≤57, 65 ≤d ≤90

			32,36,37,43,45,46,47
5	ITF	1 ≤k	48 ≤d ≤57
6	CODABAR(NW-7)	1 ≤k	48 ≤d ≤57, 65 ≤d ≤68 36,43,45,46,47,58
7	CODE128A	2 ≤k	0 ≤d ≤127
8	CODE128B	2 ≤k	0 ≤d ≤127
9	CODE128C	2 ≤k	0 ≤d ≤127

[Reference] GS H n, GS w n, GS h n, GS k m n[d1…dn]

GS k m n[d1…dn](Print bar code)

[Format] ASCII : GS k m n [d1…dn]
Hex : 1D 6B m n [d1…dn]
Decimal : 29 107 m n [d1…dn]

[Description]

M	Bar Code System	Number of characters	Remarks
65	UPC-A	11 ≤n ≤12	48 ≤d ≤57
66	UPC-E	11 ≤n ≤12	48 ≤d ≤57
67	EAN13(JAN)	12 ≤n ≤13	48 ≤d ≤57
68	EAN8(JAN)	7 ≤n ≤8	48 ≤d ≤57
69	CODE39	1 ≤n	48 ≤d ≤57, 65 ≤d ≤90 32,36,37,43,45,46,47
70	ITF	1 ≤n	48 ≤d ≤57
71	CODABAR(NW-7)	1 ≤n	48 ≤d ≤57, 65 ≤d ≤68 36,43,45,46,47,58
72	CODE93	2 ≤n	0 ≤d ≤127
73	CODE128	2 ≤n	0 ≤d ≤127

[Reference] GS H n, GS w n, GS h n, GS k m[d1…dk] NUL

GS w n(Select bar code width)

[Format] ASCII : GS w n
Hex : 1D 77 n
Decimal : 29 119 n

[Description] Sets the horizontal size of the bar code.
N specifies the bar code width as follows :

(1dot=0.125mm)

N	Module Width(dots) for Multi-level Bar Code	Binary-level Bar Code	
		Thin element width(dots)	Thick elsment wodth(dots)
1	1 (0.125mm)	1 (0.125mm)	3 (0.375mm)
2	2 (0.250mm)	2 (0.250mm)	5 (0.625mm)
3	3 (0.375mm)	3 (0.375mm)	8 (1.000mm)
4	4 (0.500mm)	4 (0.500mm)	(1.250mm)

- Multi-level Bar Code : UPC-A, UPC-E, EAN13(JAN), EAN8(JAN), CODE93 CODE128
- Binary-level Bar Code : CODE39, ITF, CODABAR
- Default : 2

[Reference] GS H n, GS h n,GS k m [d1…dn] NUL, GS k m n [d1…dn]

GS x n(Set bar code print starting position)

[Format] ASCII : GS x n
Hex : 1D 78 n
Decimal : 29 120 n

[Description] Sets the bar code print position of beginning(left).
Sets the print position of beginning using the : n x 0.125 mm
Range : n ≤255
Default : 0

[Reference] GS H n, GS w n, GS h n, GS k m[d1…dk] NUL, GS h n, GS k m[d1…dn]

DC2 ! n(Select print paper)

[Format] ASCII : DC2 ! n
Hex : 12 21 n
Decimal : 18 33 n

[Description] Selects the print paper(defaut = 0).

N	Paper
0	Normal
1	Reprint

DC2 # n(Select print density)

[Format] ASCII : DC2 # n
Hex : 12 23 n
Decimal : 18 35 n

[Description] Sets print density.

N	Density	N	Density	n	Density
0	50%	7	85%	14	120%
1	55%	8	90%	15	125%
2	60%	9	95%	16	130%
3	65%	10	100%	17	135%
4	70%	11	105%	18	140%
5	75%	12	110%	19	145%
6	80%	13	115%	20	150%

Standard paper : Mitsubishi ,P220AG(100%)

DC2 E(Set the printing finished)

[Format] ASCII : DC2 E
Hex : 12 45
Decimal : 18 69

[Description] Print data in the print buffer and moves to starting position of next page when printer is in label mode.

[Description] FF, ESC FF,DC2 m s nL nH

DC2 T(Test Printing)

[Format] ASCII : DC2 T
Hex : 12 54
Decimal : 18 84

[Description] Print the defaut seting,volt,head temperature and buffer space.

DC2 m s nL nH(The length of mark position)

[Format] ASCII : DC2 m s nL nH

Hex : 12 6d s nL nH
Decimal : 18 109 s nL nH

[Description] Sets the length of mark potion in label mode.

s=0 : mark type label paper
s=1 : no merk type label paper
Label length : (nL + nH x 256) x 0.125mm
Label range : 320 < label length < 4000

[Reference] FF, ESC FF,DC2 E

[Ex] (1) DC2 m 00h 00h 01h
Print Data1
DC2 E
DC2 m 00h 00h 01h
Print Data2
DC2 E

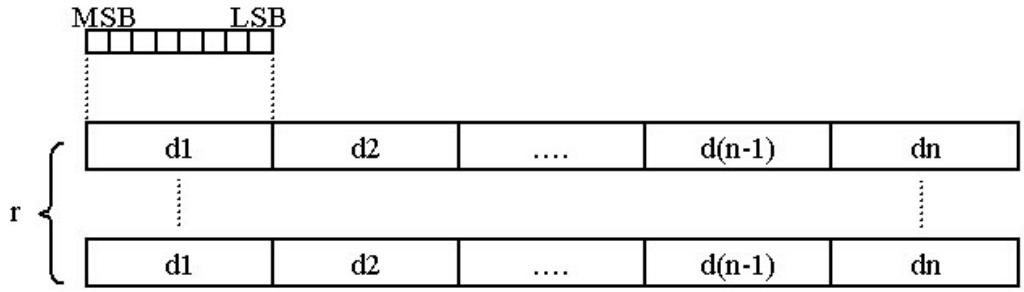
(2) DC2 m 00h 00h 01h
Print Data1
DC2 E
Print Data2
DC2 E

DC2 * r n [d1…dn](Set bit image)

[Format] ASCII : DC2 * r n [d1…dn]
Hex : 12 2A r n [d1…dn]
Decimal : 18 42 r n [d1…dn]

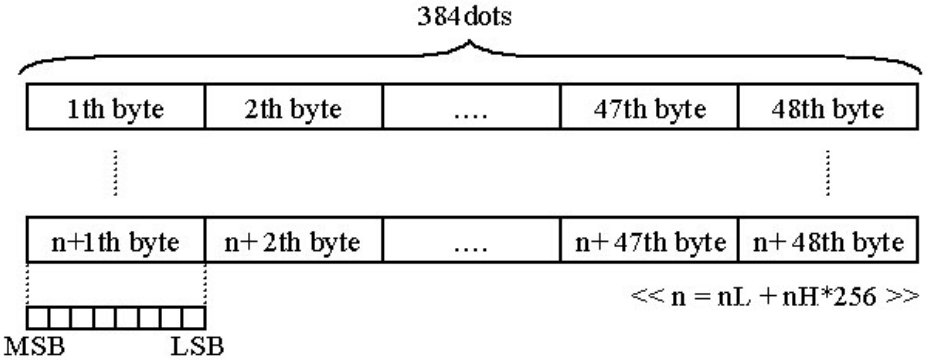
n = 0x30(48) Fixed ,r = number of line

[Description]



DC2 V nL nH(Set MSB bit image)

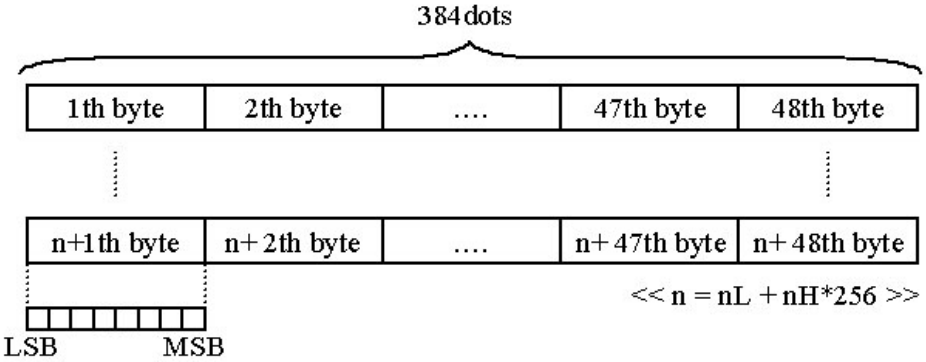
[Format] ASCII : DC2 V nL nH
Hex : 12 56 nL nH
Decimal : 18 86 nL nH
[Description]



DC2 v nL nH(Set LSB bit image)

[Format] ASCII : DC2 v nL nH
Hex : 12 76 nL nH
Decimal : 18 118 nL nH

[Description]



FS C n(Select code system)

[Format] ASCII : FS C n
Hex : 1C 43 n
Decimal : 28 67 n

[Description] : This command is valid in external ROM only(option).

N	Code system
0	JIS
1	Korean, Shift-JIS, CHINA …
2	Korean
3	Not used

- If external ROM is Japanese, Defaut = 0.
  Korea = 1
  Other cuntry = 0.

FS M n(Selects symbol of money)

[Format] ASCII : FS M n
Hex : 1C 4D n
Decimal : 28 77 n

[Description] Print the symbol of the momey.

n	Cuntry	n	Cuntry
0	Korea	3	Japan
1	U.S.A	4	Euro
2	England	5	

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	£	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	&	6	F	V	f	v	å	û	ª	╢	╞	╓	μ	÷
7	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	n
D	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	ø	2
E	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ε	■
F	/	?	O	_	o	SP	Å	ƒ	»	┐	╧	▀	∩	

	23h	24h	40h	5Bh	5Ch	5Dh	5Eh	60h	7Bh	7Ch	7Dh	7Eh
U.S.A.	#	$	@	[	\	]	^	`	{	|	}	~
FRANCE	#	$	à	°	ç	§	^	`	é	ù	è	¨
GERMANY	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
U.K.	£	$	@	[	\	]	^	`	{	|	}	~
DENMARK I	#	$	@	Æ	Ø	Å	^	`	æ	Ø	å	~
SWEDEN	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ITALY	#	$	@	°	\	é	^	ù	à	Ò	è	ì
SPAIN	Pt	$	@	¡	Ñ	¿	^	`	"	n	}	~
JAPAN	#	$	@	[	¥	]	^	`	{	|	}	~
NORWAY	#	¤	É	Æ	Ø	Å	Ü	é	æ	Ø	å	ü
DENMARK II	#	$	É	Æ	Ø	Å	Ü	é	æ	Ø	å	ü
KOREA	#	$	@	[	₩	]	^	`	{	|	}	~